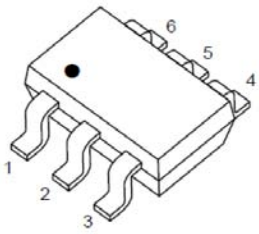
Features

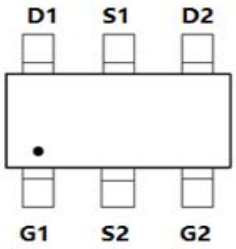
- N-channel: 40V, 7A
  $R_{DS(ON)}$ ***TYP***= 35mΩ @ V_{GS} = 10V
  $R_{DS(ON)}$ ***TYP***= 46mΩ @ V_{GS} = 4.5V
- P-channel: -40V, -6A
  $R_{DS(ON)}$ ***TYP***= 59mΩ @ V_{GS} = -10V
  $R_{DS(ON)}$ ***TYP***= 83mΩ @ V_{GS} = -4.5V
- Excellent Gate Charge x $R_{DS(ON)}$ Product(FOM)
- Very Low On-resistance $R_{DS(ON)}$
- Fast Switching Speed



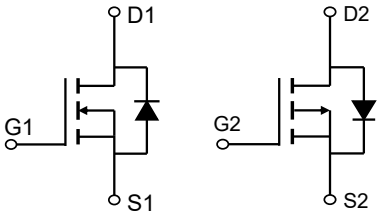
SOT-23-6L Top View

Applications

- Battery Protection
- Load Switch
- Power Management



Pin Assignment



Schematic Diagram

Absolute Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Symbol	Parameter		Value-N-channel	Value-P-channel	Units
V_{DS}	Drain-to-Source Voltage		40	-40	V
V_{GS}	Gate-to-Source Voltage		±20		V
I_D	Continuous Drain Current	T_A = 25°C	7	-6	A
		T_A = 100°C	4.4	-3.6	
I_{DM}	Pulsed Drain Current (1)		28	-24	A
P_D	Power Dissipation	T_A = 25°C	1.8	1.8	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient(2)		69	69	°C/W
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150		℃

N-channel Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 40V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.5	2.2	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = 10V, I_D = 3A	-	35	46	mΩ
		V_{GS} = 4.5V, I_D = 2A	-	46	60	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 20V, f = 1MHz	-	404	-	pF
C_{oss}	Output Capacitance		-	33	-	pF
C_{rss}	Reverse Transfer Capacitance		-	26	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DD} = 20V, I_D = 3A	-	8.4	-	nC
Q_{gs}	Gate Source Charge		-	1.62	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	1.37	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 20V I_D= 3A, R_{GEN} = 3.3Ω	-	7	-	ns
t_r	Turn-On Rise Time		-	3.5	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	6.8	-	ns
t_f	Turn-Off Fall Time		-	1.5	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	7	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	28	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 3A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=3A,di/dt=60A/μs	-	6.5	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	3	-	nC

P-channel Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = -250μA, V_{GS} = 0V	-40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -40V, V_{GS} = 0V	-	-	-1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-1.0	-1.6	-2.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = -10V, I_D = -5A	-	59	80	mΩ
		V_{GS} = -4.5V, I_D = -3A	-	83	108	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = -20V, f = 1MHz	-	316	-	pF
C_{oss}	Output Capacitance		-	37	-	pF
C_{rss}	Reverse Transfer Capacitance		-	31	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to -10V, V_{DD} = -20V, I_D = -5A	-	8	-	nC
Q_{gs}	Gate Source Charge		-	1.5	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	1.7	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = -10V, V_{DD} = -20V, I_D= -5A, R_{GEN} = 3.0Ω	-	6	-	ns
t_r	Turn-On Rise Time		-	5	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	26	-	ns
t_f	Turn-Off Fall Time		-	15	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-6	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-24	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = -5A	-	-	-1.2	V
trr	Body Diode Reverse Recovery Time	I_F=-5A,di/dt=50A/μs	-	20	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	12	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Test Circuit-N

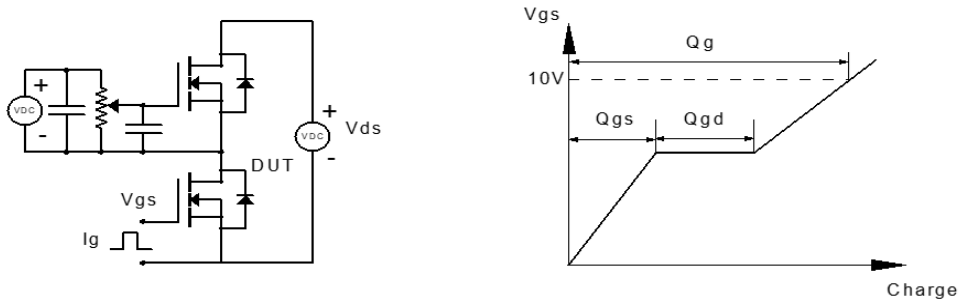


Figure 1: Gate Charge Test Circuit & Waveform

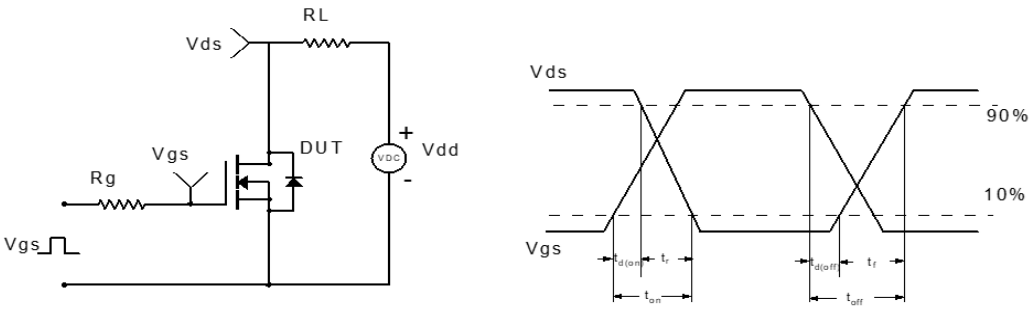


Figure 2: Resistive Switching Test Circuit & Waveform

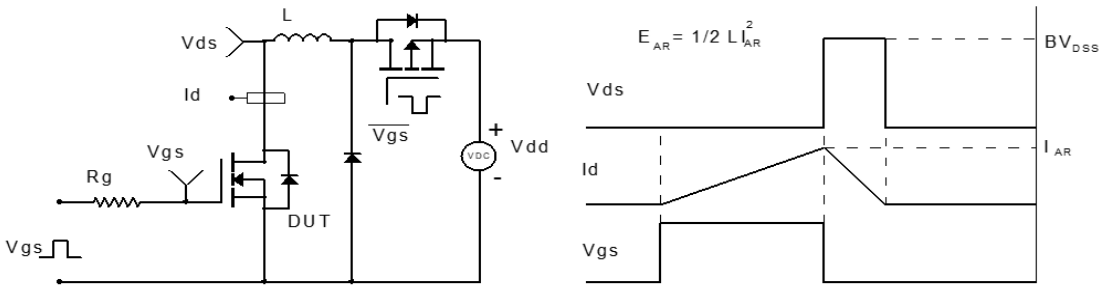


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

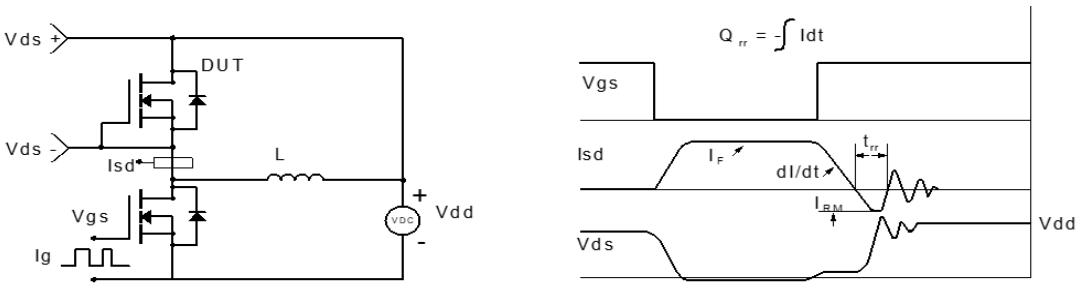


Figure 4: Diode Recovery Test Circuit & Waveform

Test Circuit-P

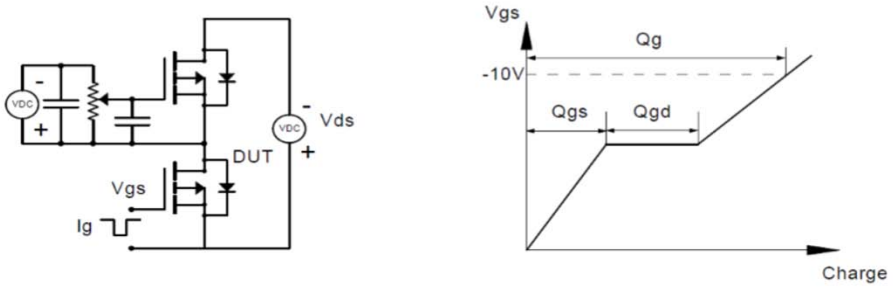


Figure 1: Gate Charge Test Circuit & Waveform

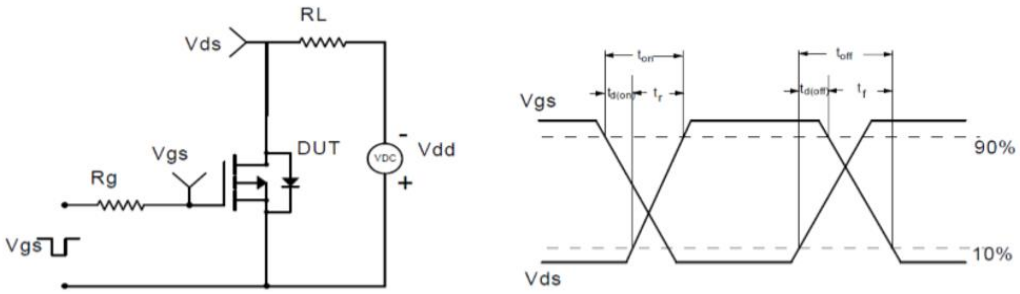


Figure 2: Resistive Switching Test Circuit & Waveform

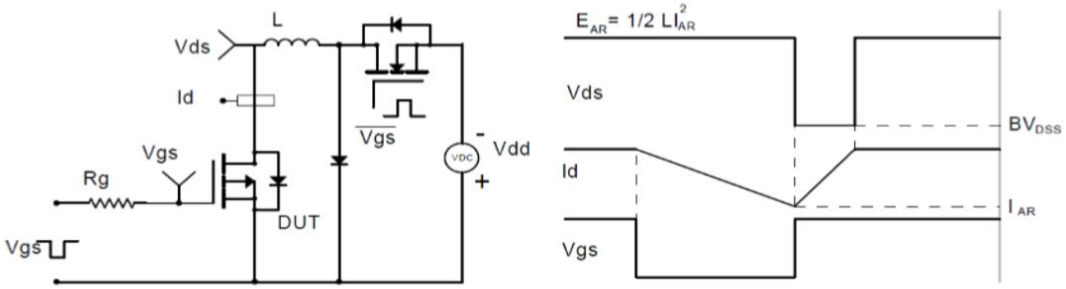


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

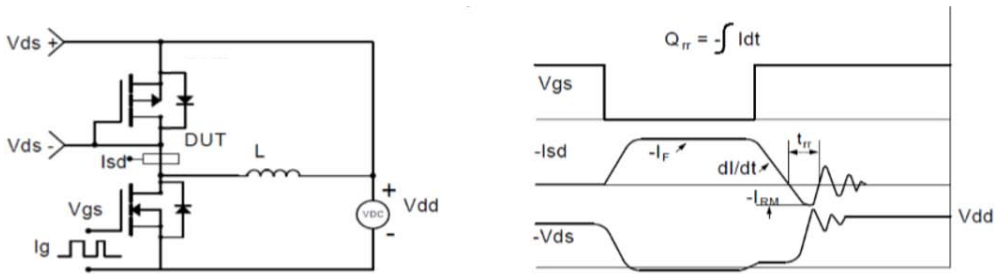
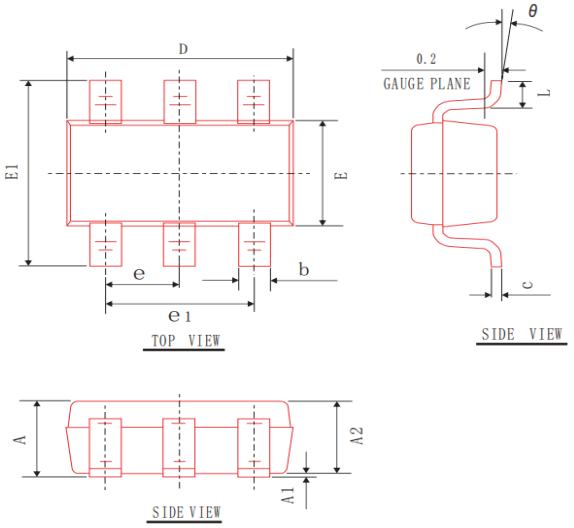


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(SOT-23-6L)



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	——	——	1.20
A1	0.00	0.05	0.10
A2	1.00	1.10	1.20
b	0.30	0.40	0.50
c	0.119	0.127	0.135
e1	1.80	1.90	2.00
D	2.80	2.90	3.00
E	1.50	1.60	1.70
E1	2.60	2.80	3.00
L	0.30	0.45	0.60
θ	0°	4°	8°
e	0.95BSC		